



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/646,810

08/25/2003

Naoki Imachi

SNY-039

1318

20374 7590 04/16/2009
KUBOVCIK & KUBOVCIK
SUITE 1105
1215 SOUTH CLARK STREET
ARLINGTON, VA 22202

EXAMINER

CHU, HELEN OK

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

04/16/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/646,810	Applicant(s) IMACHI ET AL.	
	Examiner Helen O. Chu	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,9-12 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,9-12,18-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's Amendment was received on January 21, 2009. Claim 1 has been amended. Claims 5-8, 13-17 have been cancelled. Claims 18-23 are new.
2. Applicant's Supplemental amendment was also received on January 26, 2009. Claims 1, 18 and 19 has been amended.
3. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Claim Rejections - 35 USC § 102/103

4. The rejections under 35 U.S.C 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Simon et al., on claims 1-4, 9-12 are withdrawn because the Applicant's amended the claims.
5. Claims 18, 20, 21, 23 are rejected under 35 U.S.C 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kim et al. (US Publication 2003/0073005 A1).

Regarding claims 18, 20, 21,23, the Kim et al. reference discloses a lithium secondary battery (Paragraph 5) with a negative electrode comprising carbon (Paragraph 51), positive electrode, a polyethylene separator (Paragraph 55) and a nonaqueous mixed organic solvent including two or more of the organic compounds (Paragraph 36) from a strong polar solvent groups such as gamma-butyrolactone, ethylene carbonate and N-methyl pyrrolidone (P 41). In addition, the Kim et al. reference discloses that the electrolytes have a lithium salts (P34).

Furthermore, it would be inherent that the reductive decomposition potential of the wettability improving agent is no greater than 0.0V because this is only a reference state. In addition, since the secondary battery is the same battery as the instantly claimed invention, the intrinsic properties of the wettability agent must also be the same, that is 1, 3-dioxolane has a decomposition potential of 4.5-6.2 V or 4.8 - 5.2 V.

Claim Rejections - 35 USC § 103

6. The rejections under 35 U.S.C 103(a) as unpatentable over Kim et al. (US 2003/0073005 A1), on claim 5-8, 13-16 are maintained. The rejection is repeated below for convenience.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 9-12 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kim et al. (US Publication 2003/0073005 A1).

In regard to claim 1-4, 9-12, the Kim et al. reference discloses a lithium secondary battery (Paragraph 5) with a negative electrode comprising carbon

Art Unit: 1795

(Paragraph 51), positive electrode, a polyethylene separator (Paragraph 55) and a nonaqueous mixed organic solvent including two or more of the organic compounds (Paragraph 36) from a strong polar solvent groups such as gamma-butyrolactone, ethylene carbonate (Paragraph 41). The electrolyte also comprises of lithium protecting solvent group such as dioxolane (Paragraph 42). In addition, the Kim et al. reference discloses that the electrolytes have a lithium salts (P34).

The Kim et al. reference also discloses a dioxolane is used between 0-30% by volume of the total electrolyte. These solvents are capable of providing a surface of the lithium metal with a good protective layer and capable of showing a good cycle efficiency. Therefore, it would have been obvious to one of ordinary skill to vary the mass ratio of different solvents such as 0% of dioxolane or even under 3% mass ratio of the total electrolyte solvents to choose the instantly claimed value through process optimization, since it has been held that the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable values involve only routine skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Furthermore, it would be inherent that the reductive decomposition potential of the wettability improving agent is no greater than 0.0V because this is only a reference state. In addition, since the secondary battery is the same battery as the instantly claimed invention, the intrinsic properties of the wettability agent must also be the same, that is 1,3-dioxolane has a decomposition potential of 4.5-6.2 V or 4.8 - 5.2 V.

9. Claim 22 is rejected under 35 U.S.C. 103(a) as unpatentable over Kim et al. (US Publication 2003/0073005 A1)

The Kim et al. reference discloses the claimed invention above and further incorporated herein. The Kim et al. reference also discloses the organic solvent is from 0-80% by volume of the total electrolyte (P35). The electrolytes is to help dissolve the lithium salt so that the lithium compound is capable of intercalating and deintercalating through the electrolyte (P37, 38 and P14-17). Therefore, it would have been obvious to one of ordinary skill to vary the mass ratio of different solvents such as 0% of N-methyl pyrrolidone or even under 3% mass ratio of the total electrolyte solvents to choose the instantly claimed value through process optimization, since it has been held that the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable values involve only routine skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

10. Claim 19 is rejected under 35 U.S.C. 103(a) as unpatentable over Kim et al. (US Publication 2003/0073005 A1) in view of Idota et al. (US Patent 5,196,278).

The Kim et al. reference discloses the claimed invention above and further incorporated herein but discloses the use of dioxolane in electrolytic solvents. The Kim et al. reference does not disclose the use of methyl formate in the electrolytic solvent, however, the Idota et al. reference discloses that methyl formate and dioxolane are used in the electrolytic to solvate lithium salt. The substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967);

In re Ruff 118 USPQ 343 (CCPA 1958). When a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result. **KSR**

v. Teleflex

Response to Arguments

Applicant's arguments filed January 21, 2009 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

A) Applicant argues, “ *This limitation excludes solutes other than a lithium-containing salt.. On the other hand, the battery of Kim requires, as an electrolyte, a salt having an organic cation that is capable of dissolving sulfur-based positive active material and which, as described on page 2, paragraph [0028] of Kim "do not contain lithium ions."* However, to the Examiners understanding for example, the simplest salt is $\text{Na}^+ \text{Cl}^-$ which includes a cation and an anion. The Kim et al. reference discloses a lithium salt with a cation and in order to stabilize the cation there must exist an anion in ionic bond with the cation which is equivalent to a lithium containing salt because the lithium containing salt includes a cation and an anion. At any rate the examples include solutes consisting of lithium containing salt such as LiPF_6 (P59) or $\text{Li}^+ \text{PF}_6^-$

B) Applicant's argue, “*The office suggests in the Action that it would have been obvious to one of ordinary skill in the art to reduce the mass ratio of different solvent such as dioxolane to under 3% mass ratio for the reason that discovering the optimum*

or workable values involve only routine skill in the art. optimization, however, must come from within the teachings of the prior art. Nothing in Kim suggests that the amount of DME and DOL is a result-effective variable that controls the shut-down effect of a battery during overcharging" However, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Furthermore, the working examples as disclose by the Kim et al. reference were not meant to limit the scope of the invention, please see P56

C) Applicant's argue, *"Moreover, the data of Table 3 of the present application demonstrate the criticalness of the mass ratio of the wettability improving agent. Such data are sufficient to rebut any prima facie obviousness alleged by the Office to be supported by Kim.*

For these reasons also, the 35 U~S.C. § 103(a) rejection is not proper and should be removed.

Regarding new claim 18, NMP is neither disclosed nor suggested in Kim. The oxidative decomposition potential of NMP is 4.6 V. Therefore, NMP provides the shut-down effect of the separator at a lower potential as compared to wettability improving agents having an oxidative decomposition potential of 5 V or more (See Table I and paragraph [0010])" However, the recitation "not greater than 3%" includes 0%. The Examiner have to give the broadest interpretation to the claims in light of the specification but cannot import the specification into the claim recitation. Please

Art Unit: 1795

consider revising. The Kim et al. reference does disclose NMP, please refer to the rejection above. In addition, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

D) The Applicant discloses, "Regarding new claim 19, MF is not disclosed or suggested in Kim." These arguments have been considered but are moot in view of the new rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Patrick Ryan can be reached on (571) 272-12922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOC

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795